

# Blockbuster – A Visual Explorer for Motion Picture Data

Sebastian Rexhausen\* Mischa Demarmels\* Hans-Christian Jetter\* Mathias Heilig\* Jens Gerken\* Harald Reiterer\*

Human-Computer Interaction Group  
University of Konstanz

## ABSTRACT

In this paper we introduce our visual explorer “Blockbuster” as a contribution to the InfoVis Contest 2007. The system’s development followed a user-centered design process and a design rationale considering not only the pragmatic qualities of the system, but also hedonic qualities like aesthetics or “joy-of-use”. Apart from briefly outlining the employed visualization techniques, we will focus on Blockbuster’s interaction design, which is aimed at facilitating the selection, combination and mutual filtering of visualizations under a consistent interaction paradigm. Blockbuster thereby demonstrates the potential of information visualization for end-user-centered applications that blur the boundaries of information visualization, visual information seeking and browsing.

**Keywords:** Visualization, Interaction Design, Semantic, Zooming, Coordinated Views, HyperGrid

## 1 INTRODUCTION AND APPLICATION SCENARIO

Producing and marketing new motion pictures involves high financial stakes and remarkable risks. Therefore the motion picture data provided for the InfoVis Contest 2007 could deliver valuable and interesting insight for business decisions or the dedicated movie fan. However, the amount and complexity of the data makes it necessary to develop visual tools to facilitate exploration, hypothesis generation and decision making. For example it might be important to discover (among many other questions!) if Samuel L. Jackson has been involved in commercially successful movies during the recent years and how his recent success rate is compared to that in the past.

Blockbuster is a flexible visual exploration application providing such answers and is aimed especially at the novice user without prior visualization experience.

## 2 DESIGN RATIONALE

Like any user interface and interaction design process, designing information visualization should follow an end-user-centered approach, not only limited to pragmatic qualities like usability or effectiveness, but also in regard to “hedonic qualities” like aesthetics, “joy-of-use” or pleasurable design [1].

Based on the insights and experiences gained from our user research in course of the “MedioVis” project [2], we have formulated a design rationale for Blockbuster that has served as a guideline throughout system development:

**Pragmatic qualities** – Understanding new visualization techniques is always a demanding challenge for the user and therefore a potential threat to a system’s usability. This is

especially true considering the nature of visualization as a technical science, “where the technical achievement of doing something new usually outweighs any questions on how useful or necessary a technique is” [3]. For this reason we deliberately use and combine only well-proven and straightforward visualization techniques (e.g. scatter plots, network graphs, bargrams, tables), which are especially appropriate for interactive exploration and direct manipulation (e.g. through dynamic queries [4] or semantic zooming approaches [5]).

Inspired by multiple coordinated views [6] and snap-together visualizations [7] with linking and brushing interaction, the different visualization techniques in Blockbuster can be applied simultaneously on arbitrary subsets of the data and can be displayed in arbitrary combinations and screen layouts. The user can control the layout, the subset of visualized data and the employed visualization techniques with direct manipulation, e.g. by selecting filter criteria, layouts or visualizations through continuous zooming or “drag and drop”.

**Hedonic Qualities** – The selection of colors, transparencies, fonts, font sizes, icons and animations follows a consistent style guide based on our prior experiences and is aimed at achieving high attractiveness for the user. Blockbuster tries to evoke positive emotions by offering an organic and slightly playful look and feel. Furthermore it takes up design concepts known from popular applications (e.g. Firefox) to create a feeling of familiarity and mastery for the user and to improve the system’s learnability.

On the level of interaction design Blockbuster tries to create a rich and satisfying user experience by integrating external multimedia content (e.g. images, videos, maps, web pages) through semantic zooming to provide a “browsing the shelves sensation for large collections of information items” as is recommended by [8].

## 3 INTERACTION PARADIGM

The exploration of data in Blockbuster is based on the usage of simultaneous views, which are linked by linking and brushing behavior. This allows identifying, highlighting and selecting data sets by complementary use of different visualization techniques. Blockbuster is capable of supporting the user in gaining complex insights by iteratively applying such combinations of easy-to-understand visualization techniques to narrow down the amount of visible information and to explore it in task-specific ways.

All these visualization combinations and layouts are organized on tabs similar to the multiple-document interfaces known from state-of-the-art internet browsers. This enables the user to switch between different task-specific views and to keep intermediate results or relevant selections during the exploration process.

In Blockbuster all views within a tab are synchronized and allow mutual filtering of data. If the user filters data in one visualization (e.g. by zooming into a section of a scatter plot), the data will be instantly removed from all other views on the tab. This way the consequences of filtering in one spot can be interpreted by the user through observing the effect on the other visible visualizations.

---

\*e-mail: {rexhause,demarmel,jetter,heilig,gerken,reiterer}  
@inf.uni-konstanz.de

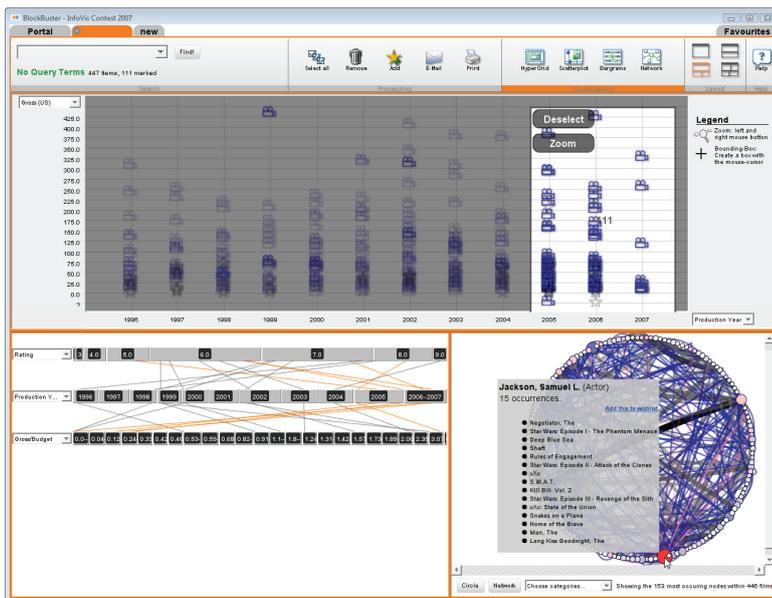


Figure 1. Data exploration with HyperScatter, parallel bargrams and social network visualization

#### 4 EMPLOYED VISUALIZATION TECHNIQUES

Blockbuster is based on four visualization techniques, which are briefly outlined in the following.

The HyperGrid is a novel zoomable table visualization developed by the WG HCI which allows relating, sorting and comparing individual data sets as rows in a table [9]. The semantic zooming functionality of the HyperGrid enables the user to explore metadata and external multimedia information (e.g. videos, maps or content from Wikipedia) “on-the-spot” inside a sticky browser window overlaying the sizable table cells. This way a free exploration of rich external content becomes possible without leaving the table as orientation frame and conceptual model thus overcoming typical problems of the loss of orientation or change blindness.

The HyperScatter is a zoomable two-dimensional scatter plot which allows an overview and the exploration of correlations between quantitative data. The HyperScatter is effective for the selection, zooming and filtering of arbitrary rectangular subsections of the plot and therefore especially supports quantitative filtering and reasoning.

The parallel bargrams in Blockbuster follow the work of [10]. In Blockbuster a single bargram serves as a visualization of the size of data subsets with certain attributes. Multiple attributes can be specified by displaying several bargrams of different attributes simultaneously. Furthermore connecting lines between the bargrams serve as a parallel coordinate visualization of the data [11] to discover correlations and characteristic distributions of the data among attributes.

The network visualization allows analyzing the relation between key persons of different categories (e.g. actors, directors) or plot keywords. Using the JUNG open source library for graph drawing the network visualizes the most occurring persons or keywords in the data as vertices and aggregates all films connecting these vertices in the edges. The number of occurrences is mapped to the color and size of the vertices’ shapes and the thickness and transparency of edges.

#### 5 CONCLUSION

To conclude our description we present a screenshot of the system in figure 1 to illustrate how the answer to the question from the introduction can be given by Blockbuster. However, due to the interactive nature of Blockbuster screenshots can only give a rough idea of the data exploration with the system. Through filtering the time period with the scatter plot and focusing Samuel L. Jackson in the network, we can discover in the bargrams that Samuel L. Jackson has been the most active actor in genres of adventure and action movies from 1996-2007. While his commercial success is clearly decreasing in the last years the IMDb rating of his movies remains approximately equally distributed in a range of 5.0 to 8.0.

#### 6 ACKNOWLEDGEMENTS

We would like to thank Werner König and Daniel Klinkhammer for their valuable input and all the contributors to the JDIC and JUNG Java open source projects which made Blockbuster possible.

#### REFERENCES

- [1] M. Hassenzahl, A. Platz, M. Burmester and K. Lehner. Hedonic and ergonomic quality aspects determine a software’s appeal. In *CHI ’00: Proceedings of the SIGCHI Conference on Human Factors in Computing Systems*, 2000, pp. 201-208.
- [2] C. Grün, J. Gerken, H. Jetter, W. König and H. Reiterer. MedioVis - A user-centred library metadata browser. In *Proceedings of the 9th European Conference, ECDL, Research and Advanced Technology for Digital Libraries*, 2005, pp. 174-185.
- [3] R. Kosara. Visualization criticism - A new way of thinking about visualization. (last checked on 13 July 2007) <http://eagereyes.org/VisCrit/VisualizationCriticism.html>
- [4] C. Ahlberg, C. Williamson and B. Shneiderman. Dynamic queries for information exploration: An implementation and evaluation. In *CHI ’92: Proceedings of the SIGCHI Conference on Human Factors in Computing Systems*, 1992, pp. 619-626.
- [5] K. Perlin and D. Fox. Pad: An alternative approach to the computer interface. In *SIGGRAPH ’93: Proceedings of the 20th Annual Conference on Computer Graphics and Interactive Techniques*, 1993, pp. 57-64.
- [6] M. Q. W. Baldonado, A. Woodruff and A. Kuchinsky. Guidelines for using multiple views in information visualization. In *AVI ’00: Proceedings of the Working Conference on Advanced Visual Interfaces*, 2000, pp. 110-119.
- [7] C. North and B. Shneiderman. Snap-together visualization: A user interface for coordinating visualizations via relational schemata. In *AVI ’00: Proceedings of the Working Conference on Advanced Visual Interfaces*, 2000, pp. 128-135.
- [8] M. Hearst, A. Elliott, J. English, R. Sinha, K. Swearingen and K. Yee. Finding the flow in web site search. In *Commun ACM*, vol. 45, pp. 42-49, 2002.
- [9] H. Jetter, J. Gerken, W. König, C. Grün and H. Reiterer. HyperGrid - accessing complex information spaces. In *People and Computers XIX - the Bigger Picture, Proceedings of HCI 2005*, 2005.
- [10] K. Wittenburg, T. Lanning, M. Heinrichs and M. Stanton. Parallel bargrams for consumer-based information exploration and choice. In *UIST ’01: Proceedings of the 14th Annual ACM Symposium on User Interface Software and Technology*, 2001, pp. 51-60.
- [11] A. Inselberg and B. Dimsdale. Parallel coordinates: A tool for visualizing multi-dimensional geometry. In *VIS ’90: Proceedings of the 1st Conference on Visualization ’90*, 1990, pp. 361-378.